REMARKS

Favorable reconsideration of this application, in light of the following discussion and in view of the present amendment, is respectfully requested.

Claims 1 and 2 are amended. Claims 1-8 are pending.

Entry of Amendment under 37 C.F.R. § 1.116

The Applicant requests entry of this Rule 116 Response because: the amendments were not earlier presented because the Applicant believed in good faith that the cited references did not disclose the present invention as previously claimed; and the amendment does not significantly alter the scope of the claim and places the application at least into a better form for purposes of appeal.

The Manual of Patent Examining Procedures (M.P.E.P.) sets forth in Section 714.12 that "any amendment that would place the case either in condition for allowance or in better form for appeal may be entered." Moreover, Section 714.13 sets forth that "the Proposed Amendment should be given sufficient consideration to determine whether the claims are in condition for allowance and/or whether the issues on appeal are simplified." The M.P.E.P. further articulates that the reason for any non-entry should be explained expressly in the Advisory Action.

I. Rejection under 35 U.S.C. § 102

In the Office Action, at page 2, numbered paragraph 4, claims 1-3, 7 and 8 were rejected under 35 U.S.C. § 102(b) as being anticipated by European Patent No. 1043689. This rejection is respectfully traversed because Watanabe does not discuss or suggest:

> reference model pattern creating means for creating a reference model pattern based on image data of a reference object with a three-dimensional reference orientation relative to said image capturing means captured by said image capturing means, said reference object having a shape substantially identical to that of the object;
>
> transformation means for performing two-dimensional and geometrical transformation on the created model pattern using a plurality of parameter sets to generate a transformed model pattern representing an image of the object with a three-dimensional orientation different from the reference orientation;...
>
> selecting means for repeatedly performing the generation of a transformed model pattern and the pattern matching of the image data of the object with the transformed model pattern to thereby select one of the transformed model patterns in conformity with the

image data of the object, and obtain information on a position of the image of the object in the image data;

means for obtaining information on a position of the image of the object in accordance with the selected one of the transformed model patterns in the image data;

means for obtaining information on the three-dimensional orientation of the object based on one of the parameter sets used for generating the selected one of the transformed model patterns; and

determining means for determining three-dimensional position and/or orientation of the object based on the information on the position of the image of the object in the image data and information on the three-dimensional orientation of the object,

as recited in amended independent claim 1.

Reference models in EP '689 are created from two-dimensional images of a reference workpiece captured in a plurality of directions by a camera, and the relative positions/postures of the workpiece with respect to the camera at the respective image capturing position/postures are stored. Thereafter, an image of a workpiece that matches one of the reference models is selected by matching processing of the reference model with the captured image, and a three-dimensional position/posture of the workpiece with respect to the camera is obtained from the image of the selected workpiece, the selected reference model and the position/posture information associated with the reference model.

The Examiner alleges that as transformation is performed of a created model pattern, this implies that the two-dimensional and geometrical transformation does not have to be on the model pattern that is captured by the camera/model pattern creating means. Claim 1, for example, has been amended to recite that the transformation means performs two-dimensional and geometrical transformation **on** the created reference model pattern that was created based on image data of the reference object with a 3-D reference orientation relative to the image capturing means captured by the image capturing means. Thus, the present invention of claim 1, for example, requires that the transformation be of **the** created reference model pattern, where the created reference model pattern was created by the creating means based on image data of a reference object.

EP '689 discusses only that the relative positions/postures of the workpiece with respect to the camera at the respective image capturing position/postures are stored. EP '689 does not discuss or suggest that a model pattern is created based on image data of a reference object and that two-dimensional and geometrical transformation is performed on the created reference

model pattern that was created based on the image data of the reference object that was captured by the image data capturing means.

Further, EP '689 does not discuss or suggest that the transformation is performed on a created model pattern that is based on image data of a reference object having a reference orientation relative to the image capturing means, where the reference object has a shape substantially identical to that of the object captured by the image data capturing means. EP '689 discusses that at m=0, the camera takes a first image of the reference workpiece at the m-th image capturing position/posture, stores the image as the m-th reference model, and obtains the relative position/posture of the camera and the workpiece and stores the relative position/posture as the m-th relative position/posture. Then at m=1, the camera takes a second image of the reference workpiece at the m+1-th image capturing position/posture, stores the image as the m+1-th reference model, and obtains the relative position/posture of the camera and workpiece and stores the relative position/posture as the m+1-th position/posture.

EP '689 does not suggest creating a model pattern based on image data of a reference object having a shape substantially identical to that of the reference object, and does not suggest that two-dimensional and geometrical transformation on the created model pattern is performed to generate a transformed model pattern representing an image of the object with an orientation different from the reference orientation. EP '689 further does not suggest that the transformation is performed using one of a plurality of parameter sets to generate the transformed model pattern representing an image of the object with a 3-D orientation different from the reference orientation. EP '689 discusses only that various reference models are created by capturing images of the workpiece based on rotation angles of the same reference workpiece.

In addition, EP '689 does not suggest a pattern matching of the image data of the object captured by the image capturing means is performed with the transformed model pattern. EP '689 discusses that pattern matching is performed to determine the model pattern that has a highest matching value from amongst the model patterns of the same reference workpiece, but EP '689 does not discuss or suggest performing pattern matching of the image data of an object with the transformed model pattern, repeatedly performing the generation of a *transformed* model pattern and the pattern matching of the image data of the object with the transformed model pattern to thereby select one of the transformed model patterns in conformity with the image data of the object.

EP '689 also does not suggest that information on a position of the image of the object is obtained in accordance with the selected transformed model pattern, and that information on the 3-D orientation of the object is obtained based on one of the parameter sets used for generating the selected transformed model pattern. EP '689 further does not discuss or suggest determining a 3-D position and/or orientation of the object based on the information on the position of the image of the object in the image data and information on the 3-D orientation of the object.

Therefore, as EP '689 does not discuss or suggest the features of amended independent claim 1, claim 1 patentably distinguishes over the reference relied upon. Accordingly, withdrawal of the § 102(b) rejection is respectfully requested.

Further, EP '689 does not discuss or suggest "reference model pattern creating means for creating a reference model pattern based on image data of a reference object with a three-dimensional reference orientation relative to said image data capturing means captured by said image data capturing means, said reference object having a shape substantially identical to that of the object; transformation means for performing two-dimensional and geometrical transformation on the created reference model pattern using a plurality of parameter sets to generate a plurality of transformed model patterns each representing an image of the object with a three-dimensional orientation different from the reference position;...means for obtaining information on a position of the image of the object in accordance with the selected one of the transformed model patterns in the image data; means for obtaining information on the three-dimensional orientation of the object based on one of the parameter sets used for generating the selected one of the transformed model patterns; and determining means for determining three-dimensional position and/or orientation of the object based on information on the position of the image of the object in the image data and the information on the three-dimensional orientation of the object," as recited in amended independent claim 2. Therefore, claim 2 patentably distinguishes over the reference relied upon. Accordingly, withdrawal of the § 102(b) rejection is respectfully requested.

Claims 3, 7 and 8 depend either directly or indirectly from independent claims 1 and 2 and include all the features of their respective independent claims, plus additional features that are not discussed or suggested by the reference relied upon. For example, claim 3 recites that "said transformation means performs the two-dimensional and geometrical transformation of an affine transformation, and said image processing device further comprises additional measuring means for obtaining a sign of inclination of the object with respect to said image capturing

means." Therefore, claims 3, 7 and 8 patentably distinguish over the reference relied upon for at least the reasons noted above. Accordingly, withdrawal of the § 102(b) rejection is respectfully requested.

II. Rejection under 35 U.S.C. § 103

In the Office Action, at pages 6-8, numbered paragraphs 6 and 7, claims 4 and 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over various combinations of EP '689, U.S. Patent Pub. No. 2003/0161537 to Maeda et al., U.S. Patent No. 6,806,903 to Okisu et al. and U.S. Patent Pub. No. 2003/0161504 to Inoue. These rejections are respectfully traversed.

Maeda, Okisu and Inoue fail to make up for the deficiencies in EP '689. Therefore, claims 1 and 2 patentably distinguish over the references relied upon for at least the reasons noted above. Claims 4-6 depend from independent claims 1 and 2 and include all the features of claims 1 and 2, plus additional features that are not discussed or suggested by the references relied upon. For example, claim 4 recites that "said additional measuring means performs dividing of a model pattern into at least two partial model patterns which are subject to the affine transformation to generate transformed partial model patterns, and pattern matching of the image data of the object with the transformed partial model patterns to determine most conformable sizes, and determines the sign of the inclination based on comparison of the sizes of the conformable partial model patterns with each other." Therefore, claims 4-6 patentably distinguish over the references relied upon for at least the reasons noted above. Accordingly, withdrawal of the § 103(a) rejection is respectfully requested.

Conclusion

In accordance with the foregoing, claims 1 and 2 have been amended. Claims 1-8 are pending and under consideration.

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

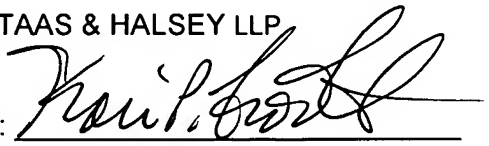
Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: April 2, 2008

By: 

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